



PHARMA DEVILS

PRODUCTION DEPARTMENT

STANDARD OPERATING PROCEDURE

Department: Production	SOP No.:
Title: Regeneration of Demineralised Water Plant	Effective Date:
Supersedes: Nil	Review Date:
Issue Date:	Page No.:

Purpose: To lay down operating procedure for regeneration of demineralised water plant.

Scope: This procedure is applicable for

Responsibility: Production Chemist
To supervise the activity

EQUIPMENTS USED:

1. Portable Deioniser
 - a) For anions & cations (Model CA-60 U)
 - b) For Mixed bed (Model MB-25)

PROCEDURE:

A. Regeneration of cations:

1. Acid Preparation:
 - a) Take 22 ltr of DM water in an anticorrosive container .
 - b) Add 10 ltr. HCL into it & stir well.
 - c) Pour this solution into the regenerant container.
2. Acid injection:
 - a) Open valve B fully.
 - b) Open & adjust raw water supply valve to get a flow of 1.25 litre/min.
3. Acid Downflow Rinse:
 - a) Pour 16 ltr. of DM water into the regenerant container & connect to raw water supply valve. Open B fully.
 - b) Open & adjust raw water supply valve to give a flow of 2.5 liter/min.
 - c) Repeat the step a) for another 16 ltr. of DM water.
4. Acid up Rinse:
 - a) Reconnect raw water inlet tube to the raw water supply valve.
 - b) Close the diaphragm valve.
 - c) Open valve C & D. Open & adjust raw water supply valve to give a Flow of 5.0 liter/ minute.
 - d) After 20 min., close valve C & D & raw water supply valve.

B. Regeneration of anions:

1. Soda preparation:
 - a) Take 32 ltr. of DM water in an anticorrosive container.



PHARMA DEVILS

PRODUCTION DEPARTMENT

STANDARD OPERATING PROCEDURE

Department: Production	SOP No.:
Title: Regeneration of Demineralised Water Plant	Effective Date:
Supersedes: Nil	Review Date:
Issue Date:	Page No.:

- b) Add 2.4 kg of caustic soda, stir to dissolve & allow to cool.
2. Soda injection;
- a) Take 16 ltr. of soda solution in a regenerant container & Connect the tubing at the top to raw water supply valve.
- b) Close the diaphragm valve.
- c) Open valve A&D. Open & adjust raw water supply valve to give flow rate of 1.25liter/minute.
- d) Repeat the procedure for another 16 ltr. of soda solution.
3. Caustic Rinse:
- a) Pour 16 liter of demineralized water into regenerant container after ensuring that it has thoroughly drained.
- b) open valve A & D. Open raw water supply valve & adjust to giive a flow of 2.5 liter/ minute.
4. Final rinse:
- a) Open raw water supply valve & diaphragm valve.
- b) Open valve C & adjust to give a flow of 10 liter/ minute.
- c) Maintain the flow till conductivity falls to an acceptable limit.
- d)
- Regeneration of Mixed Bed
1. Backwash :
- a) Open valve D fully.
- b) Open & adjust valve B to get the backwash flow of 4.5 ltr./min.
- c) Maintain the flow for 10 min.
2. Settle:
- Close all valves for 10 min.
3. Soda injection:
- a) Prepare a solution of 0.750 kg caustic soda in 12 ltr of DM water & pour into the regenerant container.
- b) Open valve E fully.
- c) Adjust valve G to maintain the flow within 10 min.
- d) Close E & G.
4. Soda Rinse:
- a) Open valve E fully.
- b) Open & adjust valve G such that the rinse water is emptied in 10 minutes..
- c) Close E & G.
5. Acid injection:
- a) Prepare a solution of 1.8 ltr. HCl in 7.5 ltr. D.M.water.
- b) Open F fully.



PHARMA DEVILS

PRODUCTION DEPARTMENT

STANDARD OPERATING PROCEDURE

Department: Production	SOP No.:
Title: Regeneration of Demineralised Water Plant	Effective Date:
Supersedes: Nil	Review Date:
Issue Date:	Page No.:

- c) Adjust valve H such that solution flows out in 10 minutes.
6. Acid Rinse:
 - a) Flush out excess acid with 7.5 ltr. DM water.
 - b) Open F fully & adjust H such that solution flows out in 10 mins.
 - c) Close F&H.
7. Air-mix:
 - a) Open D & H fully.
 - b) Connect PVC tube to the air blower & switch it on.
 - c) Carry out air mix for 10 minute at minimum pressure of 1 kg/cm².
8. Settle after Air-mix
 - a) Disconnect air inlet tube from air blower.
 - b) Open valves A,C & raw water supply valve to give maximum possible flow.
 - c) Close D & H.
 - d) Switch off the air blower.
 - e) After 1 minute, open valve D to release any air that may be entrapped inside the unit.
9. Final rinse:
 - a) Close valve D & adjust raw water supply valve to maintain the flow of 4.5 ltr./min.
 - b) Continue rinse for 10 min.
 - c) Switch on the conductivity indicator.
 - d) If conductivity does not fall below 1 microsiemen /cm, repeat step 7,8&9.
 - e) Check the pH of the water as it should be in the range of 5.5 to 7.5.
 - f) If it is found within limits, connect the raw water supply & collect the final water for use.
10. Sampling:
 - a) Intimate the QA Dept. for sampling for chemical & microbiological Testing.

Precautions:

1. The regeneration procedure must be continuous.
2. While carrying out steps 3,4,5& 6 of mixed bed regeneration , never allow the regenerant container to drain fully. Close the specified valves to prevent air locks.
3. Place the air blower at a height above the top of unit to avoid chance of water flowing into the blower.



PHARMA DEVILS

PRODUCTION DEPARTMENT

STANDARD OPERATING PROCEDURE

Department: Production	SOP No.:
Title: Regeneration of Demineralised Water Plant	Effective Date:
Supersedes: Nil	Review Date:
Issue Date:	Page No.:

4. Avoid contact of acid & alkali with eyes, skin & clothing.
5. Always wear goggles & gloves while handling the chemicals.
6. When diluting acids, always add acids to water slowly & carefully.

